REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Claims 9 and 16 have been canceled and the subject matter thereof has been incorporated into Claim 8. New Claim 22 combines the subject matter of Claims 1 and 2, while new Claim 23 combines the subject matter of Claims 1, 2 and 3. Claims 6, 7 and 17-21 have been withdrawn from consideration. Claims 1-5, 8, 10-15 and 22-23 are active in the application.

Applicants wish to thank Examiner Mayekar for the courtesy of an interview on November 4, 2003. Although no agreement was there reached, new Claims 22 and 23 include limitations based upon the discussion held at that time.

Briefly, as was discussed during the interview, the invention is directed to a high voltage treatment apparatus which is able to achieve a high field strength between the electrodes, even at relatively low voltages. For example, referring to the non-limiting embodiment of the figures, an electrode 25 of the pair of electrodes 25-26 may be a rod-like electrode supplied with a pulsed power from a power source 27. The invention is based upon the novel recognition of unexpectedly improved results in such an apparatus where the rod-like electrode has a diameter of not more than 1 mm.

For example, referring to Figure 4 of the present specification, a study was made to determine the field strength generated in the vicinity of the electrode when the diameter of the rod electrode 25 changes. As can be seen from Figure 4, in the case of pulsed power of 70kV (page 12, line 5), the field strength increased with decreased distance from the electrode surface. For rod-like electrode diameters of 5 mm and 10 mm, the increase remained substantially linear throughout the range of distances from the electrode surface. However, for electrode diameters of 1 mm or 0.5 mm, the field strength increased exponentially near the electrode surface. Thus, there was discovered to be a difference in

kind, rather than merely degree, for the field strength where the electrode diameter was 1 mm or less.

Moreover, the improved result shown by Figure 4 would have been unexpected by those skilled in the art. For example, in Figure 8 the curve marked by "squares" represents the field strength calculated according to the standard equation 1 on page 13 of the specification. As was expected, the calculated field strength increased as the distance from the electrode surface decreased. However, the actual field strength measured under simulated conditions, and represented by the curve indicated by "diamonds," increased at a substantially greater rate than was expected by simple calculation. That is, consistent with Figure 4, Figure 8 illustrates an unexpected physical mechanism which dramatically increases the field strength for small diameter electrodes (in this case, 0.25 mm).

Based upon the unexpected improved results illustrated in the graph of Figure 4, Claims 2, 8 and 22-23 recite that the rod-shaped electrode has a diameter of not more than 1 mm. Moreover, Claim 1 recites that the electrodes are constituted so that a region whose field strength is raised to a value larger than 500 kV/cm is present in the vicinity of at least one electrode. Claim 22 further recites this feature in combination with the electrode diameter being not more than 1 mm, and Claim 23 yet further recites that the voltage is not more than 100 kV. As is evident from Figure 4, it is only in the case where the electrode diameter is 1 mm or less that one is able to achieve a field strength of at least 500 kV/cm.

Claims 8-11 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent 6,491,797 to Locke et al. This rejection is believed to be moot in light of the incorporation of the subject matter of Claim 16 into Claim 8.

Claims 1-5 and 12-16 were rejected under 35 U.S.C. § 103 as being obvious over Locke et al. The Examiner there noted that the wire or hypodermic needle electrode of Locke et al." appears to lead one [of] ordinary skill in the art at the time the invention was made

towards the range of the recited diameter in absence of evidence to the contrary." However, as discussed during the interview, "evidence to the contrary" is present in the form of the unexpected improved results set forth in the specification. A *prima facie* case of obviousness can be overcome by the submission of objective evidence of nonobviousness. Such objective evidence of nonobviousness can include comparative data in the specification. In re Margolis, 228 USPQ 940 (Fed. Cir. 1986); M.P.E.P. § 716.01(a). Thus, to the extent that the Examiner is correct that the hypodermic needle or wire electrode in Locke et al. would lead one of ordinary skill in the art toward the claimed range, any resulting conclusion of obviousness is overcome by evidence of improved and unexpected results derived from the claimed invention. Here, as already discussed, providing a rod diameter of 1 mm or less produces a field strength which unexpectedly increases exponentially near the electrode surface, as compared to the substantially linear increases in field strength for larger diameter electrodes. This objective evidence of unobviousness found in the specification is unexpected from the prior art and overcomes any *prima facie* case of obviousness established by Locke et al.

Concerning Claim 1, as discussed during the interview, this claim recites a structural difference as compared to Locke et al., i.e., the pair of electrodes being "constituted" so that the field strength is greater than 500 kV/cm in the vicinity of at least one electrode. As illustrated in Figure 4, on the other hand, a construction having an electrode diameter of greater than 1 mm is unable to achieve this field strength. Moreover, this field strength would not have been obvious from Locke et al. since Locke et al. is concerned with peak voltage, and not field strength.

Regarding paragraph 6, the claims have been revised in response to the rejection under 35 U.S.C. § 112, second paragraph, which is believed to be moot.

As to paragraph 4 of the Office Action, Applicants respectfully submit that the claims are clear to those skilled in the art, and that the phrase "so as" need not be deleted.

The specification has been amended to correct a typographical error noted in paragraph 2.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

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